UNITED TECHNOLOGIES CORPORATION
PRATT & WHITNEY DIVISION
CORRECTIVE ACTION PROGRAM
2008 ANNUAL REPORT/UPDATE
PERMIT DEP/HWM-043-061

January 2009

Volume 1 of 3

Prepared for

UNITED TECHNOLOGIES CORPORATION
PRATT & WHITNEY DIVISION
400 Main Street
East Hartford, Connecticut 06108

Prepared by

LOUREIRO ENGINEERING ASSOCIATES, INC.
100 Northwest Drive
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An Employee Owned Company

LEA Comm. No. 88UT716

Pratt & Whitney
400 Main Street
East Hartford, CT 06108

Pratt & Whitney
A United Technologies Company

January 20, 2009

State of Connecticut
Department of Environmental Protection
Bureau of Waste Management
79 Elm Street
Hartford, Connecticut 06106-5127

Attn: Carmen Holzman

RE: 2008 Corrective Action Annual Report
United Technologies Corporation/Pratt & Whitney Division
400 Main Street, East Hartford, Connecticut
Permit DEP/HWM-043-061

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

UNITED TECHNOLOGIES CORPORATION
PRATT & WHITNEY DIVISION

David Russell
Director, Facilities & Services

Attachment

cc: Terry Robinson, Pratt & Whitney
Lauren Levine, United Technologies Corporation
Bill Chudzik, Pratt & Whitney
Robert Isner, Connecticut Department of Environmental Protection (w/o attachment)
Diane Duva, Connecticut Department of Environmental Protection (w/o attachment)
Maurice Hamel, Connecticut Department of Environmental Protection
Gil Richards, Connecticut Department of Environmental Protection
Brian Cutler, Loureiro Engineering Associates

January 20, 2009

Loureiro Engineering Associates, Inc.

State of Connecticut
Department of Environmental Protection
Bureau of Waste Management
79 Elm Street
Hartford, Connecticut 06106-5127

Attn: Carmen Holzman

RE: 2008 Corrective Action Annual Report
United Technologies Corporation/Pratt & Whitney Division
400 Main Street, East Hartford, Connecticut
Permit DEP/HWM-043-061

Dear Ms. Holzman:

On behalf of our client, United Technologies Corporation (UTC)/Pratt & Whitney Division, we have prepared this letter and attached annual report to provide the Connecticut Department of Environmental Protection with the status of activities being undertaken to comply with the requirements of Section IV, Part N of the above referenced permit. Specifically, this letter provides a status of those investigation and remediation activities associated with releases of hazardous waste and hazardous substances at or from the 400 Main Street, East Hartford, Connecticut facility. The annual report has been formatted to provide an update:

- On those investigation and remediation activities that have been completed;
- On those investigation and remediation activities that are presently underway;
- On post remediation monitoring and maintenance for previously completed projects;
- Of the activities planned for the next calendar year; and
- Of the cost estimate for planned investigation and remediation activities and operation and maintenance of those remediation systems presently in place.

We trust that the information contained herein meets with your satisfaction. Should you have any questions or comments, please do not hesitate to contact Lauren Levine of UTC at (860) 728-6520 or me at (860) 410-2968.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

Brian A. Cutler, P.E., L.E.P.
Senior Vice President

Attachment

Table of Contents

APPENDICES

ACRONYMS

CT ETPH	Connecticut Extractable Total Petroleum Hydrocarbons
CWS&TF	Concentrated Waste Storage and Transfer Facility
CWTP	Concentrated Waste Treatment Plant
DEP	Connecticut Department of Environmental Protection
DSN	Discharge Serial Number
ECAF	Environmental Condition Assessment Form
ELUR	Environmental Land Use Restriction
ESA	Environmental Site Assessment
GAC	Granular Activated Carbon
HWM	Hazardous Waste Management
LEA	Loureiro Engineering Associates, Inc.
LEP	Licensed Environmental Professional
LNAPL	Light Non-Aqueous Phase Liquid
O&M	Operation and Maintenance
OBB	Office Building B
OBG	Office Building G
PCBs	Polychlorinated Biphenyls
PRA	Potential Release Area
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RCP	Reasonable Confidence Protocol
RCRA	Resource Conservation Recovery Act
RCSA	Regulations of Connecticut State Agencies
RFV	Request for Variance
RSRs	Connecticut Remediation Standard Regulations
SPDES	State Pollutant Discharge Elimination System
SSVS	Sub-slab Ventilation System
SWPC	Surface Water Protection Criteria
UTC	United Technologies Corporation
VOCs	Volatile Organic Compounds
WWTP	Wastewater Treatment Plant

UNITS

gpm	gallons per minute

1. INTRODUCTION

United Technologies Corporation/Pratt & Whitney Division (UTC/Pratt & Whitney) submitted a Resource Conservation and Recovery Act (RCRA) Part B Permit Application to the regulatory agencies on September 5, 1991 for the Pratt & Whitney facility located at 400 Main Street in East Hartford, Connecticut (i.e., 400 Main Street facility). In response to the September 5, 1991 submittal and subsequent amendments, a RCRA Part B Permit to Operate a Connecticut Hazardous Waste Facility (Permit No. DEP/HWM-043-061) was issued by the Connecticut Department of Environmental Protection (DEP) on September 29, 2005. The permit authorizes the storage of hazardous wastes, non-hazardous wastes, universal wastes, and used oil generated from the design, manufacture, assembly, and testing of aircraft jet engine components and the storage and management of wastes from other UTC off-site locations. The Permit incorporates conditions requiring the implementation of a formal Corrective Action program.

Section IV, Part N of the RCRA Part B Permit requires the investigation and remediation of all hazardous waste or hazardous substances released at or on the 400 Main Street facility. The requirements for investigation and remediation are referred to herein as Corrective Action obligations. Section V of Permit No. DEP/HWM-043-061 is a Compliance Schedule associated with Corrective Action obligations for the facility. The first required task was the preparation and submission of an Environmental Condition Assessment Form (ECAF). The ECAF was submitted to the DEP on February 24, 2006. The DEP is currently reviewing the ECAF. Upon review of the ECAF, the DEP would notify UTC/Pratt & Whitney Division whether review and approval by the DEP of the remaining investigation/remediation activities will be required or whether a Licensed Environmental Professional (LEP) may verify that all known releases of hazardous waste or hazardous substances at the facility have been investigated and remediated in accordance with Sections 22a-133k of the Regulations of Connecticut State Agencies (RCSA), known as the Remediation Standard Regulations (RSRs).

1.1 Purpose

This annual report has been prepared to provide the DEP with the status of activities being undertaken to comply with the requirements of Section IV, Part N of Permit No. DEP/HWM-043-061. Specifically, this report provides a status of those investigation and remediation activities associated with releases of hazardous waste and hazardous substances at or from the UTC/Pratt & Whitney Division 400 Main Street, East Hartford, Connecticut facility. This annual report provides an update:

- On those investigation and remediation activities that have been completed during the period from December 16, 2007 through December 15, 2008;

- On those investigation and remediation activities that are presently underway, including the operation and maintenance of treatment systems presently in place;

- On post remediation monitoring and maintenance for previously completed projects; and

- Of the cost estimate for planned investigation and remediation activities and operation and maintenance of those remediation systems presently in place.

Revisions of the cost estimate will be provided on an annual basis and the current estimate is included as Appendix C. Remedial Action Plans for future proposed remedies will be submitted to the DEP in accordance with the requirements of Permit No. DEP/HWM-043-061. Detailed results and completed reports are maintained by UTC.

The investigation and remediation activities being conducted at the Site follow consistent quality assurance/quality control (QA/QC) requirements. These requirements are being summarized in a Quality Assurance Project Plan (QAPP) which is currently under preparation. The level of QA/QC information in the laboratory reports is consistent with the Reasonable Confidence Protocol (RCP) requirements even prior to September 1, 2007 when these requirements became effective.

1.2 Scope

This report applies to those investigation, remediation, and remediation system operation, maintenance and monitoring activities performed at the UTC/ Pratt & Whitney Division facility located at 400 Main Street, East Hartford, Connecticut (hereinafter referred to as the "Site"). The facility encompasses approximately 834 acres of contiguous land. Pratt & Whitney initiated aircraft engine manufacturing operations in East Hartford in December 1929. Current operations are conducted in an approximate 4-million square-foot complex and include administration and management, manufacturing, testing, research and development, and ancillary services. All of these activities take place in the western portion of the 834-acre property. The Rentschler Airport and the Klondike Area occupy the eastern portion of the property. UTC/Pratt & Whitney previously used these two areas as an airport and a storage/testing area, respectively.

1.3 Report Format

The following sections of this annual report/update have been prepared to document corrective action activities and costs associated with the implementation of future Corrective Action

obligations. Specifically, Section 2 of this report provides a summary description of projects where activities were performed during 2008 and the outcome of the activities was the completion of the project during the 2008 reporting period. Section 3 provides a summary description of projects where activities were performed but the project was not completed during the 2008 reporting period. Section 4 provides a description of maintenance and monitoring activities performed in the 2008 reporting period that were associated with either active or completed remediation projects. Section 5 provides a description of the cost estimate for future Corrective Action obligations which is presented in Appendix C.

2. 2008 COMPLETED PROJECTS

This Section provides a brief summary of those investigation and remediation projects that were completed during the period from December 16, 2007 through December 15, 2008.

2.1 2008 Completed Program Level Projects

Program level activities are those that relate to the entirety of the 400 Main Street facility and do not involve the performance of investigation or remediation. During 2008, one program level project was completed, this *2008 Annual Report/Update*.

As noted in Section 1, an ECAF was submitted to the DEP on February 24, 2006 and is currently under review. Although a final response to the February 24, 2006 ECAF has not yet been received, Section IV, Part N of Permit No. DEP/HWM-043-061 contains a reference to an annual report/update regarding corrective action activities at the 400 Main Street facility. The preparation of this document which includes an overview of ongoing and completed investigation/remediation projects at the 400 Main Street facility is intended to satisfy the annual report/update requirement referenced in the permit.

2.2 2008 Completed Investigation Projects

Activities were performed on a number of investigation projects in the 2008 reporting period. Of these projects, subsurface investigations were completed for the G Building, L&M, and Engineering Study Areas, and a groundwater investigation was completed on the Northwest Study Area. These projects were completed in the 2008 reporting period and are described below. All other investigation projects are described in Section 3.

2.2.1 G Building Study Area Phase II/Phase III Investigation

A Phase II/Phase III Investigation was performed on the G Building Study Area located at the Pratt & Whitney facility at 400 Main Street in East Hartford, Connecticut. The G Building Study Area is approximately 56,000 square feet or 1.3 acres in size out of the entire 834 acre Site. The G Building is approximately 85 feet by 375 feet and underlain by a basement on the northern portion of the building footprint. The building was constructed in 1941 and used primarily as manufacturing space, but has been recently remodeled into office space.

A total of 13 Potential Release Areas (PRAs) were identified in the G Building Study Area during the Phase I Environmental Site Assessment (ESA) previously completed for the Site. This Phase II/Phase III investigation was conducted to evaluate the 13 PRAs for evidence of

releases of hazardous materials and/or petroleum products and, to the extent releases were identified, to determine the extent of the releases.

The Phase II/Phase III investigation included the collection of concrete chip, soil, and groundwater samples from ten of the thirteen PRAs. Three PRAs were not specifically evaluated as part of this investigation. PRA-1 (Separator Sump Pit) was remediated during the 2007 building renovation and, therefore, was not investigated as part of this investigation. Investigations were not specifically conducted for PRA-9 (Groundwater Treatment System) which is actively treating groundwater, and PRA-10 (Steam Condensate Tank) which was determined to be an area not requiring investigation. The investigations of the G Building Study Area are complete and the filing of an Environmental Land Use Restriction (ELUR) to restrict Site use to industrial/commercial activities is warranted for PRA-13 (Discharge Serial Number [DSN]-004 Stormwater Lines).

The investigations of the G Building Study Area are considered complete based on work performed at the thirteen PRAs identified in this area. Based on the results of the investigations and in consideration of the remediation activities that have been completed to date, the use of administrative controls, such as the filing of an ELUR to restrict site use to industrial/commercial uses and to render certain contamination inaccessible, is an appropriate mechanism for addressing remaining contamination in the G Building Study Area. In addition to the filing of an ELUR, it will be necessary to conduct groundwater monitoring, concrete topping slab inspections for the concrete topping slab installation associated with the 2007 G Building polychlorinated biphenyl (PCB) remediation, and ongoing maintenance and monitoring of the sub-slab ventilation system (SSVS) that was installed in late 2007 to address residual volatile organic compound (VOC) contamination in groundwater beneath a portion of the G Building.

2.2.2 L&M Study Area Phase II/Phase III Investigation

A Phase II/Phase III Investigation was performed on the L&M Study Area located at the Pratt & Whitney facility at 400 Main Street in East Hartford, Connecticut. The focus of this Phase II/Phase III investigation was the L&M Study Area, which is approximately 34 acres out of the entire 834 acre Site. The main features of the Study Area are Office Building B (OBB), Office Building G (OBG), and paved parking areas. OBB was constructed from 1965 to 1966 and OBG was constructed in 1979. Prior to these dates, the areas consisted of paved parking areas.

A total of 15 PRAs were identified in the L&M Study Area during the Phase I ESA for the Site. This Phase II/Phase III investigation was conducted to evaluate the 15 PRAs for evidence of release(s) of hazardous materials and/or petroleum and, to the extent releases were identified, to determine the extent of the releases.

The Phase II/Phase III investigation included the collection of soil and groundwater samples from eleven of the fifteen PRAs. Four PRAs were not specifically evaluated as part of this investigation. Investigations were not conducted at PRA-4 (Substation 12) and PRA-5 (Substation 69) as these areas are located on the rooftops of OBB and OBG and are not considered to have the potential to adversely affect the quality of site soil and groundwater. Investigations were not conducted at PRA-12 (DSN-004 Stormwater Lines) and PRA-13 (DSN-005 Stormwater Lines), as a previous investigation of PRA-12 resulted in an understanding of the releases in this PRA and there is no documentation or evidence to support the need to investigate PRA-13.

The investigations of the L&M Study Area are considered complete based on the work performed in the PRAs identified in this area. Based on the results of the investigations, the use of administrative controls, such as the filing of an ELUR to restrict site use to industrial/commercial uses, is an appropriate mechanism for addressing contamination in soil in the L&M Study Area. Based on our understanding of the Site and the anticipated location of discharge to surface water, compliance with the Surface Water Protection Criteria (SWPC) will be attained for the groundwater concentrations of arsenic that were encountered at levels over the default numeric SWPC.

2.2.3 Engineering Study Area Phase II/Phase III Subsurface Investigation

A Phase II/Phase III Investigation was performed on the Engineering Study Area located at the Pratt & Whitney facility at 400 Main Street in East Hartford, Connecticut. The focus of this subsurface investigation was the Engineering Study Area, which is approximately 25 acres in size out of the entire 834 acre Site. The main feature of the Study Area was the Engineering Building which was constructed between February 1962 and May 1963, and has a footprint of 100,000 square feet and provides 300,000 square feet of office space.

A total of ten PRAs were identified in the Engineering Study Area during the completion of a recent Phase I Environmental Site Assessment for the Site. Three additional PRAs were identified during the subsurface investigation. This subsurface investigation was conducted to evaluate the thirteen PRAs for evidence of releases of hazardous materials and/or petroleum products and, to the extent releases were identified, to determine the extent of the releases.

Several subsurface investigations were completed prior to performing this investigation. The previous investigations included the collection of mainly soil and groundwater samples. The current subsurface investigation included the collection of concrete chip, soil, and groundwater samples from twelve of the thirteen PRAs. One PRA (PRA-6, Substation 16A) was not

evaluated as part of this investigation as it is located on the roof of the Engineering Building and the likelihood of contamination reaching soil or groundwater was considered to be very low.

The subsurface investigation resulted in the overall adequate characterization of the Study Area in the context that the limits of releases identified were confirmed through sampling and analytical testing. Investigations of the Engineering Study Area were considered to be complete based on work performed at the thirteen PRAs identified in this Study Area. Based on the results of the investigations that have been completed to date, soil remediation (likely via excavation and offsite disposal) will be required to address Connecticut Extractable Total Petroleum Hydrocarbons (CT ETPH)-contaminated soil in the vicinity of PRA-3 (Jet fuel Pipelines No. 3 and No. 4) and PRA-11 (West Parking Lot – Contaminated Soil). In addition, the use of administrative controls, including filing of an ELUR to restrict site use to industrial/commercial uses and to render certain contamination inaccessible is an appropriate mechanism for addressing remaining soil contamination in the Engineering Study Area. With respect to groundwater contamination, an ELUR to restrict future building construction for the majority of the West Parking Lot and in the area of the release identified in the vicinity of Jet fuel Pipelines No. 3 and No. 4 (localized area just south of Engineering Road) is an appropriate alternative to addressing benzene and vinyl chloride exceedances of the IVC in groundwater. In addition, quarterly groundwater monitoring will be necessary for the Study Area to fulfill the post-remediation requirements of the RSRs and to further characterize groundwater quality.

2.2.4 Northwest Area Additional Groundwater Investigation & Treatability Study

A groundwater investigation and treatability study was performed in the northwest portion of the Pratt & Whitney facility at 400 Main Street in East Hartford, Connecticut. The groundwater investigation was performed to gain an understanding of the current groundwater quality inside the facility; to further assess the extent of groundwater contamination inside the facility, including south of a known source area of hexavalent chromium and VOCs (Department 161); to obtain additional data regarding groundwater hydraulic conditions beneath the facility; and to obtain parameters necessary for the design and installation of a hydraulic containment system. The hydraulic containment system was designed in 2008 based on the results of the groundwater investigation and treatability study. Construction of the hydraulic containment system was initiated in 2008 and will be completed in January 2009.

2.3 2008 Completed Remediation Projects

The installation of a product recovery system to remove light non-aqueous phase liquid (LNAPL) in the vicinity of the steam tunnel was completed in 2008. This project is described in greater detail below.

2.3.1 Steam Tunnel Product Recovery Installation

A product recovery system was installed in the vicinity of the Steam Tunnel, which is located in the B Building Study Area at the Pratt & Whitney facility located at 400 Main Street in East Hartford, Connecticut, to remove mobile LNAPL remaining in the subsurface from a 1978 fuel release. The Steam Tunnel is an underground utility tunnel that houses various utility pipelines including steam and condensate lines. The tunnel has poured concrete floors and walls. The tunnel originates at the Power House on the western side of the Site with a main east-west tunnel that passes through B Building and leads to D Building. In D Building, a north-south branch tunnel continues south towards J Building. In B Building, a north-south branch tunnel continues north towards C Building in the vicinity of the Medical Department.

In 1978, a break in a pipeline from the Concentrated Waste Treatment Plant (CWTP) to the Powerhouse resulted in the release of waste oil. The waste oil, which was destined for use as fuel, was a mixture of waste oils containing chlorinated solvents and PCBs. The location of the pipeline break has been reported as the western edge of B Building near column K-1. Since the pipeline break, a number of monitoring and recovery wells have been installed in the area as part of various investigation and remediation activities undertaken to address the release. Approximately 270 gallons of LNAPL were removed from recovery wells installed within the vicinity of the steam tunnel between 1991 and 1995 using LNAPL recovery pumps. Some quantity of additional LNAPL may have been recovered prior to 1991. The remaining volume of separate-phase LNAPL was estimated to be between approximately 700 and 2,100 gallons by Loureiro Engineering Associates, Inc. (LEA) in 1996.

The Steam Tunnel Product Recovery System was installed in October 2008 to remove additional LNAPL in the vicinity of the release area. The recovery system consists of ten pneumatic, submersible, top-loading, low-flow (i.e. up to 2 gallons per minute [gpm]) total fluids recovery pumps. The pumps are set just below the groundwater table for maximum product recovery with the capability to adjust the pump height in order to accommodate seasonal groundwater table fluctuations. The pumps are controlled by electronic compressed air controllers located at the product recovery system control panel which can be adjusted to control flow rates at each pump. A 300-gallon stainless steel collection tote is installed for fluid collection and phase separation.

3. 2008 ACTIVE PROJECTS

This section provides a summary description of projects where activities were performed but the project was not completed during the 2008 reporting period. If activities were performed on a project during 2008 and the outcome of the activities was the completion of the project during the 2008 reporting period, a description of that project has been provided in Section 2 of this report.

3.1 2008 Active Program Level Projects -

A QAPP and a Public Participation Plan are being prepared to comply with the requirements of the Site's RCRA Part B Permit and to provide consistency between the investigation and remediation activities performed at the Site. These projects are nearly complete and will be completed coincident with the receipt of the response to the ECAF. Each project is described in greater detail below.

3.1.1 Quality Assurance Project Plan

A draft QAPP has been prepared for the Site to document the current QA/QC procedures being utilized during the ongoing investigation and remediation activities at the 400 Main Street facility. Section V, Paragraph 6(b)(iii) of the RCRA Part B Permit requires the preparation of a QAPP to ensure that the data are of sufficient quality to make decisions regarding the investigation and remediation at the site. The QAPP takes into account the *Laboratory Quality Assurance Quality Control Guidance - Reasonable Confidence Protocols Guidance Document* developed by the DEP. The QAPP also documents the auditing program to ensure the objectives of the QAPP are being met.

3.1.2 Public Participation Plan

The draft Public Participation Plan has been prepared to document the public participation procedures related to remediation activities to be conducted at the 400 Main Street facility. Section V, Paragraph 6(b)(i) of the RCRA Part B Permit requires the preparation of a Public Participation Plan to ensure the public is provided the opportunity to comment on planned remediation activities and prior to making a determination that remediation is complete.

3.2 2008 Active Investigation Projects

The following is a brief description of the work performed on investigation projects during the 2008 reporting period.

3.2.1 Northwest Area Groundwater Monitoring

Routine monthly groundwater sampling continues in the northwest portion of the Site in order to monitor and assess the groundwater quality in this area of the Site. The data obtained during the monthly sampling events are evaluated and recommendations are made for additional investigations as needed.

3.3 2008 Active Remediation Projects

This section is reserved for a description of soil, groundwater, surface water, or sediment remediation projects that were underway during the 2008 reporting period but were not completed during the 2008 reporting period. During 2008, a groundwater hydraulic control system was under construction to mitigate the migration of groundwater impacted by hexavalent chromium, as discussed below. Operation and maintenance of existing remediation systems is described in Section 4 along with the post remediation maintenance and monitoring of completed remediation projects.

3.3.1 Hexavalent Chromium Groundwater Hydraulic Control System Installation

A hydraulic control system is under construction to mitigate the migration of groundwater impacted by hexavalent chromium in the northwest portion of the Waste Treatment Study Area located at the Pratt & Whitney facility at 400 Main Street in East Hartford, Connecticut. The hydraulic control system is being installed in the parking lot west of the Concentrated Waste Storage and Transfer Facility (CWS&TF) and the groundwater treatment system is being installed inside the facility Pre-Treatment Room located in E Building.

The hydraulic control system will consist of four extraction wells with electric submersible pumps with a combined capacity of 50 gpm to intercept the groundwater plume migrating from beneath the facility in the vicinity of C Building and the CWS&TF. The extracted groundwater from the hydraulic control system will be transferred via underground piping to C Building and via overhead piping from C Building to the Pre-treatment Room in E Building. A 50 gpm groundwater treatment system will be installed within the Pre-treatment Room for the removal of VOCs in groundwater followed by the pre-treatment of hexavalent chromium. The groundwater treatment system will be installed to discharge the pre-treated wastewater to the existing Pre-treatment Room dilute wet well, which currently transfers wastewater to the Colt Street Wastewater Treatment Plant (WWTP). Final treatment of hexavalent chromium will be performed at the Colt Street WWTP as part of current operations.

3.4 **2008 Active Mitigation Projects**

This section provides a description of mitigation systems at the 400 Main Street facility.

During 2008 engineering design work was performed and bidding activities took place in respect to three areas at the 400 Main Street facility where installation of SSVS systems is slated to take place. These areas include portions of B and D Buildings; A and C Buildings; and the former D-161 area.

4. 2008 MAINTENANCE AND MONITORING ACTIVITIES

This section provides a brief overview of the maintenance and monitoring activities for remediation projects. The section has been formatted to present maintenance and monitoring of ongoing or active remediation systems first. This is followed by post remediation maintenance and monitoring of remediation activities that have been completed.

4.1 Ongoing Remediation and Mitigation Systems

This part provides a description of the operation and maintenance of remediation systems that are presently in place.

4.1.1 G Building Sub Slab Ventilation System

Due to the presence of elevated concentrations of VOCs in groundwater beneath the G Building area, a SSVS was installed during late 2007. During 2008, following start-up of the SSVS, minor adjustments were made and bi-weekly inspections of the system were conducted to check the system for unusual noise and vibration; proper operation of the relief valve; verification that the blower air filters were clean; and for leaks. During these inspections, no issues were noted and the SSVS has been operating satisfactorily with operating pressures and temperatures within acceptable ranges. In accordance with manufacturer's specifications, the inlet filter on the blower was replaced after approximately 500 hours of operation. No accumulated groundwater was observed in the liquid entrainment cylinder.

Vapor monitoring probes were installed within the footprint of the extraction piping located beneath G Building during April 2008. Measurement of the vacuum levels at the perimeter vapor probes is expected to offer an indication that the SSVS provides effective coverage of the target treatment area during continuous operation of the system. Detectable vacuum measurements were recorded in the peripheral vacuum monitoring probes during April 2008, indicating that the SSVS is providing effective coverage of the building area.

During August 2008 and November 2008, vapor monitoring activities were performed for the G Building SSVS. During each event, vapor samples from the SSVS effluent (after the carbon canisters), intermediate (between the carbon canisters) and influent (before the carbon canisters) sampling ports using 1-liter stainless steel SUMMA® canisters. The samples were submitted for VOC analysis. VOCs were detected in each of the three samples; however, the concentrations of VOCs decreased between the influent, intermediate, and effluent samples, which indicates that the carbon canisters are functioning properly and are removing VOCs from the vapor stream. LEA recorded vacuum readings from the two monitoring vapor probes installed in G Building to

ensure that the SSVS is maintaining a sufficient area of influence. The vacuum readings indicated that a sufficient vacuum was being drawn in the target sub-slab ventilation zone.

4.1.2 Steam Tunnel Product Recovery System

An Operation and Maintenance (O&M) manual was prepared by LEA to document activities necessary to support the operation of the active product recovery system installed within the former Photo Laboratory of B Building in the vicinity of the underground Steam Tunnel at the Pratt & Whitney facility located in East Hartford, Connecticut. Detailed instructions are included in this manual on the operation, maintenance and monitoring of the control systems; and operating records requirements to assist the operator in the routine operation of the product recovery system.

The product recovery system was designed to provide long-term, trouble-free operation with minimal operational and monitoring requirements. Periodic surveillance and record operating data is maintained including documentation of operations, routine inspections, routine preventive maintenance, and basic housekeeping activities. Major equipment repairs may be performed by system operational personnel or facilities maintenance personnel.

The system was designed with an automatic dialer to provide for remote alarm notification of a collection tote high level condition in between weekly inspection visits. In the event of a high level alarm, the automatic dialer will notify designated LEA personnel. The designated personnel will respond to the alarm, investigate the alarm condition, and restore the system to normal operation.

4.1.3 G Building Basement Groundwater Treatment System

Groundwater from the G Building Basement Dewatering sump is treated through liquid phase granular activated carbon (GAC) prior to discharge to the sanitary sewer. The treatment system is monitored on a periodic basis in accordance with the terms and conditions of the individual State Pollutant Discharge Elimination System (SPDES) permit to ensure proper operating conditions (Permit # SP0000191, DSN 028). The GAC is replaced on an as needed basis.

4.1.4 G Building Tunnel Groundwater Treatment System

Groundwater from the G Building Tunnel Dewatering sump is treated through liquid phase GAC prior to discharge to the sanitary sewer. The treatment system is monitored on a daily basis in accordance with the terms and conditions of the individual SPDES permit to ensure proper operating conditions (Permit # SP0000191, DSN-029). The GAC is replaced on an as needed basis.

4.1.5 C Building Basement Groundwater Treatment System

Groundwater from the C Building Basement Dewatering sump is treated through liquid phase GAC prior to discharge to the sanitary sewer. The treatment system is monitored on a periodic basis in accordance with the terms and conditions of the individual SPDES permit to ensure proper operating conditions (Permit # SP0000191, DSN-032). The GAC is replaced on an as needed basis.

4.1.6 Engineering Area Tunnel Groundwater Treatment System

Groundwater from the Engineering Tunnel dewatering sumps is treated through an air stripper. The treatment system is inspected on a periodic basis to ensure proper operating conditions. The air stripper packing is periodically cleaned as necessary. The treatment system is monitored on a periodic basis in accordance with the terms and conditions of the individual SPDES permit to ensure proper operating conditions (Permit # SP0000191, DSN-021).

4.1.7 K Building Basement Groundwater Treatment System

Groundwater from the K Building Basement Dewatering sumps is treated through an ion exchange system prior to discharge to the sanitary sewer. The treatment system is monitored on a periodic basis in accordance with the terms and conditions of the individual SPDES permit to ensure proper operating conditions. The ion exchange resin is replaced on an as needed basis (Permit # SP0000191, DSN-033).

4.2 Post Remediation Maintenance and Monitoring Activities

This part describes post remediation maintenance and monitoring activities for remediation projects that have been completed.

4.2.1 Willow Brook and Willow Brook Pond/Willow Street North

The mandatory post-remediation activities for this project include monitoring and maintenance of the engineered controls and groundwater monitoring to provide data relative to the effectiveness of the engineered control. These activities were initiated upon completion of the remediation activities in September 2002. In accordance with the *Post Remediation Groundwater Monitoring Plan* and the *Post Remediation Maintenance and Monitoring Program* for the Willow Street North project (approved by the DEP on February 10, 2006) groundwater monitoring and maintenance of engineered controls for the Willow Brook and Willow Brook Pond project and the Willow Street North project were combined beginning in September 2006 and will continue until such a time as the cessation of the activities is approved by the DEP. A

report documenting the 2008 monitoring and maintenance of the engineered controls and groundwater monitoring associated with the Willow Street North and the Willow Brook and Willow Brook Pond projects is included as Appendix A of this report.

4.2.2 F Building and H Building

The mandatory post-remediation activities for this project include monitoring and maintenance of the engineered controls and groundwater monitoring to provide data relative to the effectiveness of the engineered control. These activities were initiated in the first quarter of 2007 and will continue until such a time as the cessation of the activities is approved by the DEP. A report documenting the monitoring and maintenance of the engineered controls and groundwater monitoring associated with the F Building and H Building remediation project is included as Appendix B of this report.

5. COST ESTIMATE

This section presents the cost estimate for planned corrective action activities at the facility. From a meeting with DEP staff on February 24, 2006 and subsequent correspondence (dated June 29, 2006, July 25, 2006 and August 17, 2006) the cost estimate has been prepared as follows:

- Financial assurance will be provided for the cost of performing site-wide investigation, the implementation of Remedial Action Plans that have been submitted to the DEP for review, and the performance of long term operation, maintenance and monitoring associated with Remedial Action Plans that have been implemented.

- Once a Remedial Action Plan has been implemented, the costs associated with that activity will be subtracted from future financial assurance cost estimates.

The cost estimate is provided in Appendix C. The financial assurance mechanism will be in place by the end of March 2009.

Appendix A

2008 Annual Post Remediation Maintenance and Groundwater Monitoring Report
Willow Brook and Willow Brook Pond
And
Willow Street North
East Hartford, Connecticut

(Volume 2 of 3)

Appendix B

2008 Annual Post Remediation Maintenance and Groundwater Monitoring Report
F & H Buildings
East Hartford, Connecticut

(Volume 3 of 3)

Appendix C

Cost Estimate for Corrective Action Activities

Financial Assurance Estimates
DEP Permit HWM-043-061
Pratt & Whitney East Hartford, CT
January 2009

	Investigation	RAP implementation for 2009	Current O&M	Subtotal	
A Building	$ 222,000	$ -	$ -	$ 222,000	
B Building	$ 195,000	$ -	$ 75,000	$ 270,000	[1]
C Building	$ 321,000	$ -	$ -	$ 321,000	
D Building	$ 336,000	$ -	$ -	$ 336,000	
E Building	$ 222,000	$ -	$ -	$ 222,000	
F Building	$ -	$ -	$ 45,000	$ 45,000	[2]
G Building	$ -	$ -	$ 94,500	$ 94,500	[3]
H Building	$ -	$ -	see F bldg	$ -	
J Building	$ 372,000	$ -	$ -	$ 372,000	
K Building	$ 183,000	$ -	$ -	$ 183,000	
L Building	$ 186,000	$ -	$ -	$ 186,000	
M Building	$ 273,000	$ -	$ -	$ 273,000	
L&M Area	$ 4,000	$ -	$ -	$ 4,000	
South Production Test	$ 120,000	$ -	$ -	$ 120,000	
North Test Area	$ 325,000	$ -	$ -	$ 325,000	
Power House	$ 252,000	$ -	$ -	$ 252,000	
Experimental Test (including South Experimental Test)	$ 156,000	$ -	$ -	$ 156,000	
Waste Treatment	$ 300,000		$ 1,165,000	$ 1,465,000	[4]
Engineering Area	$ 6,000	$ -	$ -	$ 6,000	
Executive Garage	$ 69,000	$ -	$ -	$ 69,000	
Experimental Testing Airport Laboratory (ETAL)	$ 255,000	$ -	$ -	$ 255,000	
Groundwater	$ 250,000	$ -	$ 1,445,400	$ 1,695,400	[5]
Ecological Risk	$ 50,000	$ -	$ -	$ 50,000	
Total	$ 4,097,000	$ -	$ 2,824,900	**$ 6,921,900**	

Notes:

[1] Long-term obligations associated with LNAPL recovery system project

[2] Long-term obligations associated with F&H Bldg remediation project

[3] Future long-term obligations associated with G-building remediation project

[4] Long-term obligations associated with Willow Brook, Willow Pond and Willow Street remediation projects and hexavalent chromium hydraulic control

[5] Operation and maintenance of groundwater treatment systems in basements and tunnels